

Appl. No. : **known**
Filed : **herewith**

Attached hereto is a marked-up version of the changes made to the application by the current amendment. The attached page is captioned "**Version with Markings to Show Changes Made**"; additions are shown in **bolded** and deletions are shown [bracketed].

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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Dated: 11/10/02

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Version with Markings to Show Changes Made

IN THE ABSTRACT:

The abstract has been amended as follows:

[ABSTRACT] **Abstract of the Disclosure**



A connector [(16,24,18,20)] for [the] connection of a pipe end portion of coiled tubing [(10) comprises means (22)] **adapted** for connecting a piece of downhole [equipment, and] **equipment. The connector** is formed by three separate parts that can be screwed together two and two, of which a radially inner shrinkable adapter sleeve [(20)] compressively surrounded by an elongate outer adapter and connector sleeve [(18)] ensures the securing of the end portion of the coiled tubing [(10)], whereas a freely projecting, internally threaded end portion of the outer sleeve [(18)] ensures the connection to the remaining part [(16,24)] of the connector in the screwing together. [To obtain a connector which,] **The connector**, besides exhibiting [superior] **improved** tensile, flexural and compressive strength properties, is also well suited to absorb torques [applied, the] **applied. The** inner shrinkable adapter sleeve [(20)], which has an external jacket surface of an axially conical extent, is provided with external threads, complementarily matched by the internal threads of the outer adapter and connector sleeve [(18)], which are formed in the bore-defining inner circumferential surface, which has a conical extent in the axial direction, its conicity complementarily corresponding to the externally conical extent of the inner adapter sleeve [(20)].

IN THE SPECIFICATION:

Page 1, immediately after the title, please insert --**Related Applications** This is the U.S. National phase under 35 U.S.C. § 371 of International Application PCT/NO00/00214, filed June 22, 2000, and claims the benefit of the Norwegian application 19993437 filed July 12, 1999.—**Background of the Invention**—**Field of the Invention**—.

Page 1, Immediately after Line 15, please insert --**Description of the Related Art**—

Please amend the paragraph on Page 2, beginning on line 1, as follows:

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Existing connectors of this kind normally comprise an adapter sleeve with an externally conical smooth surface. Such an adapter sleeve with a smooth [non threaded] surface will cause a great expansive force on an external adapter and connector sleeve surrounding the adapter sleeve, when the connector is subjected to tensile load. This disadvantageous condition is normally compensated for by increasing the external diameter of the connector, which is also unfortunate and disadvantageous.

Please amend the paragraph on page 2, beginning on line 13, as follows:

Existing connectors are generally locked by set screws meant to have the task of absorbing torques. This is a particularly unfortunate construction as such screws are **generally** [completely] unsuitable for such a task, and may, at worst, come loose through vibrations, and may fall out, after which the loose set screws may cause damage to the well and downhole equipment.

Please amend the paragraph on page 2, beginning on line 20, as follows:

Therefore, **there is a need for a connector and method of connection to** [the objective of the present invention has been to] remedy or reduce, to a substantial degree, by simple means the drawbacks, disadvantages and limitations of use of conventional connectors of this kind and of other known connectors of similar types, and thus provide a connector for the purposes in question, in which the external diameter is kept as small as possible, and which exhibits, with dimensions corresponding to those of known connectors, a higher tensile end compressive strength and greater resistance towards external torques applied thereto.

Please amend the paragraph on page 2, beginning on line 30 as follows:

Summary

The aforementioned needs are satisfied by a connector for connecting the end portion of a pipe, a pipeline, a pipe string or coiled tubing. The connector is formed or provided with at least one connecting device for equipment/tools, and comprises parts that

can be screwed together and have aligned bores for the accommodation of said pipe end portion which is secured in the connector in the screwed-together condition of the parts. The connector further comprises a radially inner transversally shrinkable adapter sleeve which is to bear in the connected position at its inner circumferential surface in a clamping manner against the outer jacket surface of the pipe end portion. The inner adapter sleeve has an external conically extending threaded jacket surface that is formed in a view of cooperating with a surrounding outer adapter and connector sleeve with an internal conically extending threaded circumferential surface. The outer adapter and connector sleeve is formed to cooperate with a threaded jacket portion of a socket-like connecting element formed on an end piece having the said connecting device. [A connector of the kind indicated in the introductory part of claim 1, distinguishes itself from conventional and other known couplings through the features comprised by the characterizing part of claim 1.]

Please amend the paragraph on page 3, beginning on line 9, as follows:

The [This] adapter sleeve is split and can be shrunk around the coiled tubing by [means of] the outer adapter and connector sleeve formed with a conical threaded inner surface complementarily corresponding to the conicity of the adapter sleeve. The sleeve wall of **the** [this] outer adapter and connector sleeve is **tapered** [tapering] gradually in the direction of the end piece incorporated in the connector, and can be screwed to the socket-like connecting element of **the** said end piece, said connecting element having an externally conical sleeve wall tapering towards its free end, complementarily corresponding to the conicity of the outer sleeve, with external threads.

Please amend the paragraph beginning on page 3, line 20, as follows:

The socket-like connecting element of the end piece normally has a smooth cylindrical bore of a diameter [insignificantly exceeding] **selected to slide over the** outer diameter of the coiled tubing.

Please amend the paragraph beginning on page 3, line 23, as follows:

The diameter of the internally threaded bore of the outer **adapter and connector** sleeve exceeds[, over almost the entire length thereof,] the diameter of the coiled tubing, [i.e. apart from an] **other than at the** end portion positioned at maximal distance from said end piece, wherein the [external] **outer adapter and connector** sleeve is formed with an annular inward flange of a comparatively large axial extent and of a diameter [which only insignificantly exceeds] **selected to fit** the outer diameter of the coiled tubing.

Please amend the paragraph beginning on page 4, line 19, as follows:

The externally conical adapter sleeve with external left-hand [treads] **threads**, incorporated in the connector according to the invention, will be capable of adopting torques, and the torque applied will tighten the inner adapter sleeve even more firmly to the external wall surface of the coiled tubing.

Please amend the paragraph beginning on page 5, line 22, as follows:

Then the outer adapter and connector sleeve is screwed, by its internally conical threaded portion, along the externally conical threaded surface of the internal adapter sleeve, complementarily corresponding the conicity of the outer sleeve, and - as the inner diameter of the threads of the outer sleeve decreases - the inner shrinkable sleeve is compressed transversally thereby transferring compressive forces from the outer sleeve to the coiled tubing, which is thereby secured. When an optimal degree of securing has been achieved, the outer sleeve has, from its free end, a free (not in threaded engagement with the inner adapter sleeve) internally conical threaded end portion, which - on adjustment, according to experience, of the position of the inner adapter sleeve relative to the end of the coiled tubing in the position of use - shall have a larger axial longitudinal extent than the **depth** [dept] of entering (depth of screwing) of the socket-like connecting element of the end piece, extending over said depth of entering, conically narrowing towards its free end.

Please amend the paragraph beginning on page 6, line 19, as follows:

These and other objects and advantages of the invention will become more fully apparent from the following description of a non-limiting embodiment taken in conjunction with the accompanying drawings. [A non-limiting example of a present preferred embodiment will be explained in the following with reference to the accompanying drawings, in which:]

Brief Description of the Drawings

Please amend the paragraph beginning on page 7, line 4, as follows:

Detailed Description of the Preferred Embodiment

[A] Reference will now be made to the drawings wherein like numerals refer to like parts throughout. Fig. 1 illustrates a connector for the connection of the end portion of a pipe, a pipeline, a pipe string or coiled tubing 10 comprises (besides the seals 12 and 14 in the form of O-rings positioned in internal circumferential grooves in the connector parts 16 and 18, which can be screwed together) three parts 16, 18 and 20 that can be screwed together.

Please amend the paragraph beginning on page 7, line 17, as follows:

The end piece 16 has a first, internal annular shoulder surface 26, which forms an abutment surface for the end surface of the coiled tubing 10. In an axial distance from this internal, annular abutment surface 26 the externally conical threaded socket-like connecting element 24 is defined by an, axially seen, annular shoulder surface 28 determining the **depth** [dept] of entering/screwing of the connecting element 24 into an outer adapter and connector sleeve 18 forming the second part of the connector.

Please amend the paragraph beginning on page 9, line 18, as follows:

[The] **To form a connection using the connector described above, the** outer adapter and connector sleeve 18 is first passed over the coiled tubing 10 from the free end thereof, until this outer sleeve 18 adopts a position along the coiled tubing 10, in which its left-hand end of a

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minimal sleeve wall thickness is positioned at an axial distance from the outer free end of the connecting socket 24, said distance exceeding the axial length of the inner adapter sleeve 20.

Please amend the paragraph beginning on page 9, line 25, as follows:

Then the inner split, radially shrinkable adapter sleeve 20 is pushed and is brought to an initial position with its left hand end of **a maximum inner adapter sleeve thickness** at a suitable **position** (experience will reveal how much this inner adapter sleeve can be expected to be moved axially by the displacing movement of the outer adapter sleeve towards the left during the engagement and displacement of its conical internal threads with/along the cooperating conical external threads of the inner adapter sleeve 20), whereas the constantly decreasing diameter of the bore of the outer sleeve effects a radial compression, transversal "shrinkage", of the inner adapter sleeve, whose compressive forces ensure the securing of the surrounding annular portion of coiled tubing.

On Page 10, immediately after Line 18, please insert the following paragraph



Although the foregoing description of the preferred embodiments of the invention has shown, described and pointed out the fundamental novel features of the invention, it will be understood that various omissions, substitutions and changes in the form of the detail of the apparatus as illustrated, as well as the uses thereof, may be made by those skilled in the art without departing from the spirit of the present invention. Consequently, the scope of the invention should not be limited to the foregoing discussion, but should be defined by the appended claims.

IN THE CLAIMS:

The claims have been amended as follows:

[Amended claims] **WHAT IS CLAIMED IS:**



1. (Amended) A connector [(16,18,20)] for [the connection of] **connecting** the end portion of a pipe, a pipeline, a pipe string or coiled tubing [(10) and] , **wherein the connector is** formed or provided with at least one connecting device [(22)] for equipment/tools,

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[preferably downhole equipment/tools,] **the** said connector [(16,18,20)] comprising parts [(16, 18 and 20)] that can be screwed together and have aligned bores for the accommodation of said pipe end portion, which is to be secured in the connector in the screwed-together condition of the parts [(16, 18 and 20)], said connector [(16,18,20)] further comprising a radially inner transversally shrinkable adapter sleeve [(20)], which is to bear, in the connected position, at its inner circumferential surface in a clamping manner against the outer jacket surface of the pipe end portion [(10)], characterized in that the adapter sleeve [(20)] exhibits an external, conically extending threaded jacket surface, which is formed with a view of cooperating with a surrounding outer adapter and connector sleeve [(18)] with an internal, conically extending threaded circumferential surface, said outer adapter and connector sleeve [(18)] being formed to cooperate with a threaded jacket portion of a socket-like connecting element [(24)] formed on an end piece [(16) or similar, exhibiting] **having the** said connecting device [(22) for downhole equipment etc].

2. (Amended) A connector [according to claim] **of Claim 1**, wherein the outer adapter and connector sleeve [(18)] has an axial length that exceeds the double axial length of the inner adapter sleeve [(20)], whose length essentially corresponds to the depth of entering/screwing of the socket-like connecting element [(24)] into the outer **adapter and connector** sleeve [(18)], characterized in that the connector parts, which can be screwed together, in the form of the inner sleeve [(20)] and the socket-like connecting element [(24)] of the end piece [(16)], both have **substantially** straight cylindrical bores, whereas the outer **adapter and connector** sleeve [(18)] has a **substantially** straight cylindrical outer jacket, so that the conical extent of each of said parts [(16, 18 and 20)] results in a sleeve wall thickness decreasing towards one end, the parts cooperating with each other two and two, in a total wall thickness essentially corresponding to one sleeve wall thickness.

3. (Amended) A connector [according to claim 1, 2 or 3, characterized in that] **of Claim 1, wherein** at the end located the farthest from said end piece with the socket-like connecting element [(24)], the outer **adapter and connector** sleeve [(18)] is formed with an inward annular flange defining a sleeve bore section of a diameter generally corresponding to the outer diameter of the coiled tubing.

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4. (Amended) A method of establishing the connection and securing of a pipe end portion [(10)] to [/in] a connector [(16,18,20) formed in accordance with one or more of the preceding claims, characterized in that externally over a free pipe end portion (10), which is to be connected to and thereby be secured in the connector, is first passed an elongate adapter sleeve (18) with an inner surface extending longitudinally conical, defining the sleeve bore and provided with threads, after which an inner shrinkable adapter sleeve (20) with a threaded jacket surface of an externally conical extent is passed over the pipe end portion (10) and is positioned in the longitudinal direction thereof, after which the outer adapter and connector sleeve (18) is screwed by its internally threaded circumferential surface on the external threaded portion of the inner adapter sleeve (20) and compresses the inner adapter sleeve (20) constantly more during the relative displacement of their cooperating conical surfaces in the longitudinal direction of the connector, whereby the portion of the outer sleeve (18), compressively enclosing the inner sleeve (20), is constantly decreasing in bore diameter in the screwing, at the completion of which a free internally threaded bore wall portion of the outer sleeve (18) projects axially beyond the nearest end of the shrunk inner sleeve (20), after which the connecting operation is completed in that an externally threaded, conically extending socket-like connecting element (24) of an end piece (16) included in the connector, is screwed into said free internally threaded bore wall portion of the outer sleeve (18), until the free end surfaces of the outer sleeve (18) abuts, in a movement-limiting manner, an annular stop surface (28) by said connecting element (24).] **that comprises an elongate adapter sleeve, an inner shrinkable adapter sleeve, and an end piece that includes a socket-like connecting element, wherein the elongate adapter sleeve comprises an inner surface extending longitudinally conical so as to define a sleeve bore and wherein the sleeve bore is provided with threads, wherein the inner shrinkable adapter sleeve comprises a threaded jacket surface of an externally conical extent adapted to be received by the threaded sleeve bore and wherein the inner surface of the inner shrinkable adapter sleeve is dimensioned to fit over the end portion of the pipe, wherein the end piece comprises an externally threaded conically extending socket-like element adapted to be received by the threaded sleeve bore, wherein the end piece further comprises an annular stop surface dimensioned to engage the larger diameter bore end of the elongate adapter sleeve, the method comprising:**

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positioning the elongate adapter sleeve over the end portion of the pipe in a longitudinal manner;

positioning the inner shrinkable adapter sleeve over the end portion of the pipe;

engaging the threaded jacket surface of the inner shrinkable adapter sleeve with the threaded sleeve bore wherein resulting screwing action compresses the inner adapter sleeve gradually during the relative displacement of their cooperating conical surfaces in the longitudinal direction of the connector until a free internally threaded bore wall portion of the outer sleeve projects axially beyond the nearest end of the shrunk inner sleeve; and

engaging the conically extending socket-like connecting element of the end piece into the free internally threaded bore wall portion of the of the outer sleeve until the free end of the elongate adapter sleeve abuts the annular stop surface.

Please add the following new Claims:

5. (New) The connector of Claim 1, wherein the end piece is adapted to receive downhole equipment at the end substantially opposite from the socket-like connecting element.

6. (New) The connector of Claim 1, wherein the external threads of the inner adapter sleeve is left-handed.

7. (New) The connector of Claim 6, wherein the internal surface of the inner adapter sleeve comprises threads that bite into the surface of the pipe to resist displacement of the inner adapter sleeve relative to the pipe.

8. (New) The connector of Claim 7, wherein the threads of the internal surface of the inner adapter sleeve is right-handed.

9. (New) The connector of Claim 6, wherein the external threads of the inner adapter sleeve transfers external torque on the connector so as to further tighten around the pipe so as to resist circumferential displacement of the inner adapter sleeve relative to the pipe.